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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/982,886	10/22/2001	Seiji Hashimoto	35.C15892	7524
5514	7590	06/30/2005	EXAMINER	
FITZPATRICK CELLA HARPER & SCINTO 30 ROCKEFELLER PLAZA NEW YORK, NY 10112			VIEAUX, GARY	
			ART UNIT	PAPER NUMBER
			2612	

DATE MAILED: 06/30/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/982,886

Applicant(s)

HASHIMOTO, SEIJI

Examiner

Gary C. Vieaux

Art Unit

2612

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 07 February 2005.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-13 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-13 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 07 February 2005 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

DETAILED ACTION

Change of Examiner

5 The prosecution of this application has been transferred to Examiner Gary C. Vieaux from the docket of Examiner Jeremy R. Elder. Any inquiry concerning this or earlier communications should be directed to the current Examiner of record. Current contact information is provided in the last section of this communication.

Amendment

10 The Amendment filed February 7, 2005 has been received and made of record. In response to the first Office Action, the Title, the Specification, and claims 1, 2, 4, 7, 9, 10, and 12 have been amended.

 In response to Applicant's amended Specification, the Examiner finds the
15 amendment directly addresses the previous inconsistency between the drawings and the specification in regards to indicator 66 in figure 9A, and therefore, this objection to the Drawings is hereby withdrawn.

 In response to Applicant's amended Drawings, the Examiner finds the amended
20 figures 11 and 12 to properly indicate the drawings as Prior Art, because only that which is old is illustrated, and therefore, this objection to the Drawings is hereby withdrawn.

 In response to Applicant's amended Title, the Examiner finds the amended title of the invention is not descriptive. A new title is required that is clearly indicative of the invention to which the claims are directed. Therefore, this objection is maintained.

Response to Arguments

Applicant's arguments filed on February 7, 2005, have been fully considered but they are not persuasive.

Regarding amended claim 1, Applicant contends the amended language of claim

5 1 overcomes the Wadsworth reference, in that the Wadsworth reference fails to disclose independent control of each of the shift registers to the output line (Remarks, p. 9, lines 8-10.) The Examiner respectfully disagrees.

Amended claim 1, as currently written, provides for "a common output line to which signals from said plurality of charge detection circuits are sequentially output"
10 (Amendments, p. 4 lines 12-13), in addition to "a scanning circuit adapted to control each of said plurality of transfer transistors independently to output the signals from said plurality of charge detection circuits to said common output line (Amendments, p. 4 lines 16-18.) Wadsworth provides timing signals (col. 4 lines 4-8) to control multiplexing operation of the shift register, which inherently indicates independent control of each
15 individual shift register necessary to effect sequential output on the common output line. Therefore, the Examiner respectfully stands behind the rejection of claim 1 as currently written.

Regarding claims 2-9, each depend either directly from or indirectly from independent claim 1 and, thus, inherit all the limitations of independent claim 1.

20 Consequently, based on their dependence and the foregoing response to arguments relating to claim 1, the Examiner respectfully stands behind the rejections to claims 2-9.

Regarding amended claim 10, Applicant contends the amended language of claim 1 overcomes the Wadsworth reference, in that both the Wadsworth reference and the Noguchi reference fail to disclose that the A/D converters function together with the charge detection circuits (Remarks p. 9, lines 22-24.) The Examiner respectfully

5 disagrees.

Amended claim 10, as currently written, provides for "a plurality of A/D conversion circuits adapted to convert the signals from said charge detection circuits into digital signals", with additional of the digital signals description provided thereafter (Amendments, lines 11-12 of claim 10, p. 6.) Noguchi provides sequential transfer of
10 analog image signals into a plurality of A/D converters for conversion into digital signals (fig. 1, col. 3 lines 22-37.) As provided in the Office Action of November 3, 2004, it would have been obvious to one of ordinary skill in the art to combine the teachings of Wadsworth with the plurality of A/D converts as taught by Noguchi for the benefit of enabling faster scan speeds (p.9 lines 7-11.) It is clear that the A/D converters would
15 function together with other circuitry, such as a charge detection circuit, based on their presence in order and functional need, be it conversion of an analog signal after prior processing or conversion to a digital signal for successive processing, respectively. Therefore, based on the compatible functionality of the A/D conversion, the Examiner respectfully stands behind the rejection to amended claim 10, as currently written.

Claim Rejections from Office Action of November 3, 2004

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

5 (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

10 Claims 1-3, 7 and 9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Wadsworth et al. (US #5,449,908).

Regarding claim 1, Wadsworth et al. disclose image pickup element formed on two substrates (10 and 12 in fig. 1) (col. 3, lines 49-58), but the substrates are on a
15 single semiconductor chip (10 and 12 in fig 2a) (col. 4, lines 25-30).

Wadsworth et al. disclose photoelectric conversion units (CCD 14). The CCD units are shown as a plurality of vertical columns (fig. 1) meaning the photoelectric conversion units are arranged two-dimensionally.

Since Wadsworth et al. disclose a plurality of CCDS (columns 14 in fig. 1)
20 adapted to transfer charges generated by said photoelectric conversion units arranged two-dimensionally, official notice is taken that the column of CCDS are connected to a vertical line of photoelectric conversion units.

Wadsworth et al. disclose a plurality of charge detection circuits (fig. 7) adapted to detect the charges from said plurality of CCDS and supplying corresponding signal
25 levels, each of said plurality of charge detection circuits being arranged correspondingly to each CCD (fig. 1 and col. 3, lines 49-62).

Wadsworth et al. also disclose a common output line 26 to which signals from charge detection circuits are sequentially output (fig. 1 and col. 4, lines 2-4).

Wadsworth et al. discloses a multiplexing shift register 22 as a switch (fig. 2a). Official notice is taken that a transistor can be substituted for the switch and produce the
5 same outcome.

Wadsworth et al. disclose a scanning circuit (multiplexing shift registers 22) adapted to control the transfer transistors to sequentially output the signals from the charge detection circuits to the common output line (fig. 1 and col. 4, lines 2-4).

10 Regarding claim 2, Wadsworth et al. disclose a signal processing circuit (CDS circuit 20) inserted between the transfer transistor (switch 22) and the charge detection circuit (diode 16 and CTIA 18) (figures 1 and 2a and col. 3, line 59-66).

Regarding claim 3, correlated double sampling circuits remove noise.

15

Regarding claim 7, Wadsworth et al. disclose the charge detection circuit having a control circuit (transistor 54) adapted to supply power when an input unit of the charge detection circuit is reset and when the charges from the CCD are converted into a voltage and output (fig. 7 and col. 6, lines 35-47).

20

Regarding claim 9, it is well known that CCDS are used in imaging devices, therefore official notice is taken that a camera for use as described by inventor includes

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a lens and a signal processing circuit adapted to process a signal from solid-state image pickup element.

Claim 4 is rejected under 35 U.S.C. 103(a) as being unpatentable over
5 Wadsworth et al. (US #5,449,908) as applied to claim 1 above, and further in view of
Tamayama (US #6,618,089).

Regarding claim 4, Wadsworth et al. do not disclose details of their correlated
double sampling circuit 20.

However, Tamayama discloses a CDS circuit 16 that includes a clamp that
10 sample-holds the image signal (col. 5, lines 57-60).

It would have been obvious to one of ordinary skill in the art at the time of
invention to use the CDS clamp circuit of Tamayama with the invention of Wadsworth et
al. for the benefit of using the sample-hold capability giving more time for the image
signal to be read from the CCD.

15

Claim 5 is rejected under 35 U.S.C. 103(a) as being unpatentable over
Wadsworth et al. (US #5,449,908) as applied to claim 1 above, and further in view of
Miyake (US #5,767,904).

Regarding claim 5, Wadsworth et al. do not disclose sweeping unnecessary
20 charges from photoelectric conversion units. However, Miyake discloses a CCD control
circuit 48 giving a charge sweep (clear) signal to the CCD (col. 15, lines 37-40). It would
have been obvious to one of ordinary skill in the art at the time of invention to use the

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sweep method of Miyake with the CCD system of Wadsworth for the benefit of creating means for resetting the CCD before exposure.

Claim 6 is rejected under 35 U.S.C. 103(a) as being unpatentable over
5 Wadsworth et al. (US #5,449,908) as applied to claim 1 above, and further in view of
Woolaway (US #5,925,883).

Regarding claim 6, Wadsworth et al. disclose the charge detection circuits (fig. 7)
being provided in common to the plurality of CCDS 14 (fig. 1 and col. 3, lines 59-62),
but does not disclose transistors connecting the circuits to the CCDS.

10 However, Woolaway does disclose transistors (not numbered but activated by
signal " Φ_{tr} ") connecting the CCDS to the charge detection circuit (Readout and Scene
Motion Compensation (RSMC) circuit 11) (fig. 3 and col. 4).

It would have been obvious to one of ordinary skill in the art at the time of
invention to use a transistor such as the one in Woolaway to connect the CCD to charge
15 detection circuit for the benefit of controlling the timing of signals from the CCD to the
charge detection circuit.

Claim 8 is rejected under 35 U.S.C. 103(a) as being unpatentable over
Wadsworth et al. (US #5,449,908) as applied to claim 1 above, and further in view of
20 Nam (US #5,477,070).

Regarding claim 8, Wadsworth et al. do not disclose the CCD and charge
detection circuit being separated by a well.

However, Nam discloses the charge diffusion region 18 and the end of the CCD (marked by clock pulse $\Phi 1$) being separated by an n-well (fig. 3 and col. 2, lines 15- 21).

It would have been obvious to one of ordinary skill in the art at the time of invention to use the n-well separation of Nam in the CCD of Wadsworth et al. for the benefit of reducing pulse noise produced by the signal processing circuit.

Claims 10 and 12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Wadsworth et al. (US #5,449,908) in view of Noguchi et al. (US #6,504,574).

Regarding claim 10, Wadsworth et al, disclose image pickup element formed on two substrates (10 and 12 in fig. 1) (col. 3, lines 49-58), but the substrates are on a single semiconductor chip (10 and 12 in fig 2a) (col. 4, lines 25-30). Wadsworth et al. disclose photoelectric conversion units (CCD 14). The CCD units are shown as a plurality of vertical columns (fig. 1) meaning the photoelectric conversion units are arranged two-dimensionally.

Since Wadsworth et al. disclose a plurality of CCDS (columns 14 in fig. 1) adapted to transfer charges generated by said photoelectric conversion units arranged two-dimensionally, official notice is taken that the column of CCDS are connected to a vertical line of photoelectric conversion units.

Wadsworth et al. disclose a plurality of charge detection circuits (fig. 7) adapted to detect the charges from said plurality of CCDS and supplying corresponding signal levels, each of said plurality of charge detection circuits being arranged correspondingly to each CCD. (fig. 1 and col. 3, lines 49-62).

However, Wadsworth et al. do not disclose a plurality of A/D converters connected to CCD columns.

Noguchi et al. disclose a CCD image sensor 10 with A/D converters 14 each connected to a CCD column 12 (fig. 1 and col. 3, lines 22-37).

5 It would have been obvious to one of ordinary skill in the art at the time of invention to use the multiple A/D converters of Noguchi et al. in the CCD of Wadsworth et al. for the benefit of enabling faster scan speeds.

Regarding claim 12, see claim 9.

10

Claims 11 and 13 are rejected under 35 U.S.C. 103(a) as being unpatentable over Wadsworth et al. (US #5,449,908) and Noguchi et al. (US #6,504,574) as applied to claim 10 above, and further in view of Sugiki (US #5,990,948).

15 Regarding claim 11, neither Wadsworth et al. nor Noguchi et al. disclose an A/D conversion of sequential-comparison type.

Sugiki et al. disclose a noise canceling circuit for pixel signals.

Sugiki et al. disclose A/D converter 406 is a sequential comparison type (col. 9, lines 7-12).

20 It would have been obvious to one of ordinary skill in the art at the time of invention to use a sequential comparison type A/D converter for the benefit of having a converter that is of mid-range speed that is closer to the scanning time period. 19.

Regarding claim 13, see claim 8.

Conclusion

THIS ACTION IS MADE FINAL. Applicant is reminded of the extension of time
5 policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the
10 shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Contact

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Gary C. Vieaux whose telephone number is 571-272-7318. The examiner can normally be reached on Monday - Friday, 8:00am - 4:00pm.

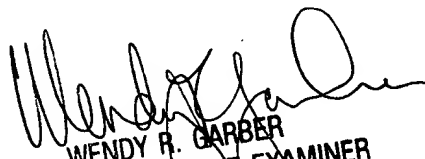
If attempts to reach the examiner by telephone are unsuccessful, the examiner's
20 supervisor, Wendy Garber can be reached on 571-272-7308. The fax phone number for the organization where this application or proceeding is assigned will be 703-872-9306 until September 15, 2005, and beginning July 15, 2005 will be 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only.

- 5 For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Gary C. Vieaux
Examiner
Art Unit 2612

10 Gcv2


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